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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/964,739	09/28/2001	Woong Kwon Kim	043694-5015-03	2171
9629	7590	01/15/2004	EXAMINER	
MORGAN LEWIS & BOCKIUS LLP 1111 PENNSYLVANIA AVENUE NW WASHINGTON, DC 20004			HON, SOW FUN	
			ART UNIT	PAPER NUMBER
			1772	19
DATE MAILED: 01/15/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/964,739

Applicant(s)

KIM, WOONG KWON

Examiner

Sow-Fun Hon

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-9,11,13-17 and 20-22 is/are pending in the application.
- 4a) Of the above claim(s) 17 and 20-22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-9,11 and 13-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/16/03 has been entered.
2. Claim 16 is missing in the revised amendment submission in Paper # 18 (filed 10/16/03) but is treated as having the same wording as previously presented in the present Office Action.

### ***Response to Amendment***

#### ***Withdrawn Rejections***

3. The 35 U.S.C. 112,2<sup>nd</sup> paragraph and 103(a) rejections are withdrawn due to the amendment in Paper # 18 (filed 10/16/03) and the new grounds of rejection set forth below.

#### ***New Rejections***

#### ***Claim Rejections - 35 USC § 112***

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

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5. Claims 1, 3-9, 11, 13-16 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. It is unclear whether the etching method of etching the substrate in a case filled with etchant is interpreted as chemical etching (specification, page 3, lines 1-5). Applicant is respectfully requested to confirm.

6. Claims 1, 3-8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In light of the specification, it appears that the preamble in claim 1 of "A glass substrate" should be deleted since there are two glass substrates, not one.

***Claim Rejections - 35 USC § 103***

7. Claims 1, 3-5, 8-9, 11, 13, 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kitayama et al. (US 5,654,057) in view of Kimock et al. (US 5,637,353).

Kitayama et al. has liquid crystal display device (LCD) glass substrates wherein the glass substrate is a laminate of plural glass substrates (sheets) and the glass substrate has a layer on the surface formed from chemical ion-exchange (abstract). Kitayama et al. teaches that the chemically reinforced glass substrate has a compressive stress in the surface thereof in order to balance out the internal tensile stress (column 6, lines 60-65).

Kitayama et al. teaches that a silica protective film is formed on the glass substrate (column 10, lines 50-55), but fails to teach that it takes the place of the ion-exchanged surface layer by having a configuration which imparts a compressive stress to the outer surface of at least one of the first glass substrate and the second glass substrate, or that the outer surface of at least one of the first glass substrate is chemically etched.

Kimock et al. has a glass substrate which is etched with ions or atoms (column 10, lines 50-55). The etching is essential to achieve a highly adherent interface between the glass substrate (parent substrate 1) and the inorganic diamond like carbon layer (column 10, lines 60-65). A diamond like carbon (DLC) layer (column 12, lines 20-25) or a first layer of silicate ( $\text{SiO}_2$ ) layer (column 12, lines 35-40) is then deposited onto the glass substrate (plate). The coating exhibits superior adherence (column 12, lines 40-45) and abrasion wear resistance (column 11, lines 60-65).

Etching with ions or atoms involves some form of chemical reaction of the ions or atoms with the surface of the glass substrate, and thus constitute chemical etching.

Kimoch et al. teaches that the coating is under significant compressive stress (column 1, lines 50-55). Thus the coating imparts a compressive stress to the outer surface of the glass substrate.

Although Kimoch et al. is not directed to a liquid crystal display, it is directed to solving the same problem of providing a protective layer for a glass substrate for optical use (column 4, lines 25-30).

Therefore it would have been obvious to one of ordinary skill in the art to have used the abrasion wear resistant coating (column 12, lines 40-45) with significant compressive stress in place of the ion-exchanged layer with compressive stress in the

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invention of Kitayama et al. in order to obtain a glass substrate with improved abrasion wear resistance, and neutralization of the tensile stress within the glass substrate for the prevention of cracks which may occur due to an external impact.

In addition, Kitayama et al. teaches an additional protection layer formed of organic tetra-alkoxysilane coating on the inorganic protection layer (column 10, lines 60-65), but fails to teach that it takes the place of the ion-exchanged surface layer by having a configuration which imparts a compressive stress to the outer surface of at least one of the first glass substrate and the second glass substrate. Kitayama et al. teaches that the surface of the glass substrate has to have a compressive stress due to the internal tensile stress within the glass substrate (column 6, lines 60-65). Thus it would have been obvious to one of ordinary skill in the art to form the organic tetra-alkoxysilane coating with compressive stress, to impart a compressive stress to the outer surface of the glass substrate, in order to neutralize the internal tensile stress within the glass substrate for the prevention of cracks which may occur due to an external impact.

8. Claims 6-7, 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kitayama et al. in view of Kimoch et al. as applied to claims 1, 3-5, 8-9, 11, 13, 16, and further in view of Mizuta et al. (US 5,260,157).

Kitayama et al. has been discussed above and teaches the organic tetra-alkoxysilane coating as a protective layer for the glass substrate (column 10, lines 60-65). Tetra-alkoxysilane is a thermosetting resin which has a viscosity coefficient of between approximately several cp and approximately several ten cp as evidenced by Mizuta et al.

Mizuta et al. teaches that tetra-alkoxysilane is an organosilane (column 5, lines 20-25) which is a thermosetting silicone resin (column 5, lines 15-20). The tetra-

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an organic monomer prior to initiation of the thermosetting process, and thus has low viscosity which falls within the range of approximately several cp and approximately several ten cp.

***Response to Arguments***


9. Applicant's arguments with respect to claims 1,3-9, 11, 13-16 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication should be directed to Sow-Fun Hon whose telephone number (571)272-1492. The examiner can normally be reached Monday to Friday from 7:30 AM to 3:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Pyon, can be reached on (571)272-1498. The fax phone number for the organization where this application or proceeding is assigned is (703)872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571)272-1300.

SH  
Sow-Fun Hon  
01/08/04

  
HAROLD PYON  
SUPERVISORY PATENT EXAMINER  
1772

1/9/04